NAME: [redacted]

FINAL

MICROANATOMY ~~MIDTERM~~ EXAM
MARCH 6, 1997

QUESTIONS 1 TO 76 SELECT THE SINGLE BEST ANSWER:

1. Select the correct statement. The skin consists of ...

   A. only thick skin.
   B. the epidermis, dermis, and hypodermis. (not really)
   C. the stratified squamous keratinized epithelium and dense irregular connective tissue.
   D. the epidermis, dermis, hair, nails and glands (sebaceous and sweat).
   E. All of the above.

2. Select the correct statement.

   A. Melanocytes are responsible, ultimately, for protecting the skin from ultraviolet (U.V.) light.
   B. Keratinocytes must be dead to fully accomplish their principal function in skin.
   C. Langerhans cells are usually found in the stratum spinosum.
   D. A and B are correct.
   E. A, B, and C are correct.

3. Select the correct statement.

   A. The entire hair shaft is composed of keratinocytes containing soft keratin.
   B. Eccrine sweat glands are the glands affected in individuals with acne.
   C. Hair growth is cyclic with terminal hair of the scalp usually having the longest growth phase.
   D. Apocrine sweat glands are the most common type of sweat gland.
   E. None of the above are correct.

4. Select the correct statement.

   A. There are numerous mechanoreceptors in the nail plate.
   B. The dermal papillae of thick and thin skin help hold the hypodermis to the dermis.
   C. Most of the melanin found in the skin is present in the keratinocytes.
   D. The cleavage lines of the dermis are formed by the break down and degradation of the collagen and elastic fibers.
   E. Pemphigus is a genetic disease which results from the lack of zonula occludens in the stratum spinosum.

5. Select the **INCORRECT** statement.

A. Epidermal wound healing involves the proliferation and migration of the stratum basale cells.
B. Granulation tissue is the newly forming connective tissue in a deep wound that is undergoing repair.
C. Psoriasis results from the too rapid proliferation and subsequent sloughing of the keratinocytes before they are completely mature.
D. First degree burns have loss of skin function and have greater systemic effects than local effects.
E. Thermal regulation is controlled by shunting blood to/from the superficial blood plexus.

6. Select the correct statement.

A. Striae or stretch marks are found only on women who have had children.
B. Dimethyl sulfoxide (DMSO) is a penetrating agent which can carry poisons as well as drugs or innocuous materials through the epidermis.
C. Involucrin is the glycolipid secreted by cells only in the stratum basale.
D. The enzyme, transglutaminase, is an enzyme unique to melanocytes.
E. Exposure to lots of UV-A does not increase your chances of skin cancer.

7. During accommodation for near vision

A. the lens assumes a rounder shape
B. the ciliary muscle relaxes and the suspensory ligaments (zonules) increase tension
D. the pupil dilates
E. the cornea changes curvature

8. The lens

A. contains primarily GAGS
B. provides 2/3 of the focussing power of the eye
C. is composed primarily of modified epithelial cells called lens fibers
D. contains no living cells
E. is enclosed in a thick hydrated capsule of dense irregular CT

9. Identify a correct statement about neural elements in the eye

A. the neural retina develops from the corneal epithelium
B. axons in the ganglion cell axon layer are myelinated
C. Muller cells transmit visual information to the ganglion cells
D. light penetrates ganglion cell layer before it reaches the photoreceptors
E. light penetrates the pigment epithelium before it reaches the photoreceptors

10. Which of the following is correct concerning photoreceptors.

A. rods are more common than cones in the fovea centralis
B. cones are most sensitive to dim light
C. cones are most concentrated at the optic disk
D. rods are sensitive to light, while cones are sensitive to darkness
E. cones are responsible for color vision

11. Which of the following is not a component of the tunica fibrosa of the eye.

A. Iris
B. Cornea
C. Sclera
D. Bowman's membrane
E. Descemet's membrane

12. Rods (photoreceptors) in the eye

A. contain rhodopsin photopigment which is sensitive to dim light
B. are concentrated in the fovea centralis
C. are most sensitive in bright colored light
D. contain numerous melanocytes in their apical surface which form the retinal pigment epithelial layer
E. contain photopigments sensitive to red, green, and blue

13. Identify a correct statement about the vestibular system

A. the semicircular canals contain numerous calcium carbonate crystals called otoliths
B. the otolith organs are most sensitive to gravity
C. there are three otolithic maculae in each ampulla, positioned orthogonal to one another
D. the cupula contains a higher density of otolithic granules than the macula
E. The otolithic membrane is normally surrounded by perilymph

14. Identify a correct statement about inner ear anatomy

A. the scala tympani borders the basilar membrane
B. the scala tympani and scala media connect at the helicotrema
C. the vestibular (Reissner's) membrane separates the scala vestibuli and scala tympani
D. perilymph is created by the stria vascularis
E. middle ear bones directly vibrate the round window in the scala tympani

15. The stria vascularis of the inner ear

A. anchors the inner aspect of the organ of Corti.
B. is composed of a vascularized epithelium thought to produce endolymph.
C. is the embryological precursor of the inner hair cells.
D. is composed of epithelial cells thought to secrete the tectorial membrane.
E. separates the scala vestibuli from the round window.

16. The cornea

A. provides 1/3 of the focussing power of the eye.
B. contains no nerve endings.
C. contains a high water content to maintain clarity.
D. is avascular and receives most of its nutrients by diffusion.
E. is composed primarily of modified epithelial cells.

17. Sympathetic innervation in the eye controls the action of

A. the ciliary muscle.
B. the pupillary dilator muscle.
C. the cornea.
D. the pupillary constrictor muscle.
E. the lens.

18. Which of the following is not true of thyroid follicles

A. Contain the thyroid hormone precursor thyroglobulin
B. Are usually lined by a simple cuboidal epithelium
C. Are composed of follicular epithelial cells that release thyroxin (T3,T4)
D. Contain parafollicular cells which regulate the secretion of thyroxine from the follicular epithelial cells
E. Contain parafollicular cells that release calcitonin

19. Which of the following is not produced by a neuron?

A. Antidiuretic hormone (Vasopressin) ✓
B. Luteinizing hormone -releasing hormone (LHRH) ✓
C. Epinephrine ✓
D. Thyroid stimulating hormone
E. Oxytocin ✓
→ uterus & mammary gland

20. Which of the following is INCORRECTLY matched?

A. Oxyphils -- parathyroid gland ✓
B. TSH -- basophils ✓
C. Herring bodies -- pars nervosa ✓
D. Vasopressin -- pars ~~distalis~~ nervosa
E. Epithelially-lined follicles -- pars intermedia ✓

21. Which of the following is INCORRECTLY matched?

A. D(elta) cells of the pancreas - somatostatin ✓
B. Parenchymal cells of the adrenal medulla - epinephrine & norepinephrine ✓
C. Theca interna cells - estrogen ✓
D. B(eta) cells of the pancreas - insulin ✓
E. Oxyphils - parathyroid hormone
→ Zo - not known → released by Principal cells of Parathyroid

22. Which of the following cells are correctly paired with it's secretory product?

A. Acidophils of the pars distalis - FSH (follicle-stimulating hormone)
B. Oxyphil cells - parathyroid hormone
C. Acidophils of the pars distalis - prolactin
D. Chromaffin cells of adrenal gland - aldosterone
E. Chromophobes of the adenohypophysis --(MSH) melanocyte stimulating hormone

23. Oxyphil cells are present in the

A. adenohypophysis.
B. pineal gland.
C. neurohypophysis.
D. parathyroid gland.
E. adrenal cortex.

24. Which ONE of the following "structure-secretory product" combinations is correct?

A. Corpus luteum - progesterone and estrogen.
B. Acidophils of the pars distalis - follicle-stimulating hormone
C. Beta cells of the islets of Langerhans - glucagon.
D. Zona glomerulosa of the suprarenal gland - cortisol.
E. Parafollicular cells - parathyroid hormone (PTH).

25. The human parathyroid gland secretes parathyroid hormone which acts peripherally to...

A. increase the absorption of calcium in the small intestine.
B. increase calcium deposition in bone, lowering blood calcium levels.
C. influence gonadal development in the period prior to sexual maturity.
D. decrease the excretion of phosphate by the kidneys.
E. increase both the number of cellular mitochondria and their cristae.

26. Which is true of chromaffin cells

A. They are associated with venules instead of capillaries like other endocrine cells.
B. Each receives parasympathetic innervation.
C. They synthesize and store acetylcholine which when oxidized give the cell a brown color.
D. When exposed to adrenocortical gonadal steroids they convert norepinephrine to epinephrine.
E. They release their product via exocytosis upon stimulation by sympathetic neurons of the autonomic nervous system.

27. A hormone released by which of the following is responsible for uterine contractions during parturition (the act of giving birth)?

A. Pars nervosa
B. Pars distalis
C. Pars intermedia
D. Pars tuberalis
E. Adenohypophysis

28. The anatomical bulk of the secondary capillary plexus (capillary plexus II) formed by the anastomoses of the hypothalamo-hypophyseal portal system is located in the...

A. Pars tuberalis
B. Pars distalis
C. Pars intermedia
D. Infundibular stalk
E. Median eminence

29. The pancreatic cell type responsible for the synthesis and secretion of glucagon is the

C
A. Acinar cell
B. Beta (B) cell
C. Alpha (A) cell
D. D cell
E. F cell

30. Not a normal component of arterioles or venules:

D
A. Tunica intima
B. Tunica media
C. Tunica adventitia
D. Vasa Vasorum

31. Myocardial cells extend into the tunica adventitia of the

E
A. Aorta
B. Pulmonary artery
C. Left main coronary artery
D. Superior vena cava
E. None of the above

32. The basic tissue type of Purkinje fibers is

B
A. Epithelium
B. Connective
C. Muscle
D. Neural

33. Which statement is NOT TRUE about the thoracic duct or right lymphatic duct?

A. There is smooth muscle in the tunica media.
B. They are not innervated.
C. They contain vasa vasorum.
D. The adventitia is relatively underdeveloped.
E. Smooth muscle is both longitudinally and circularly arranged.

34. Which of the following statements concerning the olfactory region is **FALSE**?

A. It is located in the superior portion (roof) of the nasal cavity.
B. It contains olfactory cells which are actually bipolar neurons.
C. The watery mucus that washes this region is primarily supplied by bowman's glands.
D. The basal cells in the epithelium replace the sustentacular cells when they die.
E. odors are detected via chemical receptors on the surface of long microvilli that lie on the surface of the olfactory epithelium.

35. At which of the following sites is pseudo-stratified ciliated columnar epithelium with goblet cells normally located?

A. Anterior surface of the epiglottis
B. Oropharynx
C. True vocal folds
D. False vocal folds
E. Respiratory bronchioles

36. Which of the following is not a component of the air-blood barrier?

A. Type I cells = squamous alveolar cells
B. Endothelial cells of alveolar capillaries
C. A fused basal lamina produced by two adjacent epithelia
D. Clara cells

37. Which of the following cells is found primarily lining bronchioles, contains numerous mitochondria as well as secretory granules and secretes glycosaminoglycans (GAGs) onto the luminal surface of the airway?

A. Small granular cells
B. Clara cells
C. Ciliated columnar cells
D. Goblet cells
E. Type II cells = great alveolar cells

Id #: [redacted]
Name: [redacted]
Date: 1-25-1997

Class: BEH SCI
Time:

Course #: BEH96-97

		B B	A B C D		
Test Key:	BECCEDADBA	CADACBCEAC	AEACCDBEAC	BABDACEDBA	DEBDECADED
Items 1-50:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	*A*A**E*C*	***B***B**	E***A**B**	DD*****BE*	*B****E*DC
Test Key:	AAADADBADE	CBCACDACCA			
Items 51-100:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	*CB***E*B*	EE*E*C**DB			

EX03 1 Form B

Possible Points:	70
Raw Score:	43
Objective Score:	43
Essay Score:	
Percent Correct:	61.4%

CUMULATIVE

Possible Points:	212
Raw Score:	152
Percent Correct:	71.7%
In-progress Grade:	P

MATCHING: **(Questions #12-16)**

Match the cellular location (A-E) with the most appropriate substance, enzmye, or activity (#'s 12-16).

correct answers ↓

A. Golgi
B. Plasmalemma
C. Peroxisomes
D. Mitochondria
E. Lysosome

E 12. ~~A~~ Acid Phosphatase

D 13. D Oxidative Phosphorylation

A 14. E Mannose 6-Phosphate Production

C 15. C Catalyase

B 16. B Membrane Glycoproteins

SELECT THE SINGLE BEST ANSWER:

MENC

17. Which of the following lists contains examples of each of the four basic tissue types? Nervous, CT, Epithelial,

~~A.~~ Smooth muscle, blood, cardiac muscle, and skeletal muscle
(B) Smooth muscle, mucoid tissue, endothelium, and axons of a peripheral nerve
~~C.~~ Lining of blood vessels, simple tubular gland, cardiac muscle, and blood
~~D.~~ Reticular tissue, fibrocartilage, Schwann cells of a peripheral nerve, and neurons.
~~E.~~ Stratified squamous non-keratining epithelium, neurons in a ganglion, smooth muscle cells, and neurons in the central nervous system

18. When a gland is described as a compound acinar gland, it means that the gland... tubulo-acinar

(A) has branched ducts.
~~B.~~ consists of cells that liberate their secretory product into the blood.
C. contains secretory cells in a long narrow tube.
~~D.~~ is present only in the parenchyma of an organ.
E. is always composed of stratified columnar epithelium.

SELECT THE SINGLE BEST ANSWER:

19. Stratified epithelia are named according to...

A. the shape of the most basal cells.
B. the type of cell to cell association.
C. the shape of the most superficial cells.
D. A, B and C above are correct.
E. A and B above are correct.

20. The epithelial structure of the secretory region of sweat glands is...

A. simple squamous.
B. stratified squamous non-keratinizing.
C. stratified squamous keratinizing.
D. simple cuboidal.
E. transitional.

21. The epithelium of the vagina and the esophagus is classified as...

A. simple squamous.
B. stratified squamous keratinizing.
C. stratified squamous non-keratinizing.
D. simple cuboidal.
E. transitional.

22. Select the correct statement.

A. A fibroblast may be considered a secretory cell.
B. Normally, there is no type III collagen present in areloar connective tissue.
C. Multilocular fat cells, fibroblasts, mast cells and macrophages may all be found in areolar connective tissue all over the body.
D. A ligament consists primarily of collagen type II.
E. None of the above are correct.

23. Select the correct statement.

A. Basophils and mast cells are incapable of diapedesis.
B. In hypersensitive reactions, edema is responsible for the swelling of tissues due to release of the histamine from eosinophils in the area.
C. The immediate precursor to the mast cell is the basophil.
D. Mast cells can be classified as paracrine cells.
E. None of the above are correct.

SELECT THE SINGLE BEST ANSWER:

24. Select the correct statement.

A. Under the stimulus of insulin, the fat cells break down and release lipids from white adipocytes.
B. Brown fat cells do not use the lipoprotein lipase enzyme system to get lipid from chylomicrons into their cells.
C. Multilocular adipocytes are frequently found in the bone marrow of 8-12 year old children.
D. Under parasympathetic stimulation, epinephrine stimulates the release of lipids from the brown fat.
E. None of the above are correct.

25. Select the correct statement(s).

A. The basement membranes of osteocytes are rich in collagen type IV, laminin, fibronectin and heparin sulfate, which help attach the cell to the extracellular matrix.
B. Reticulocytes are found scattered throughout the lymph node medullary sinuses.
C. Pericytes are multipotential cells which may, on demand, differentiate into cartilage cells.
D. Collagen formation is a very slow process which requires years to completely replace all the collagen fibers in gums and periodontal ligaments.
E. All of the above are correct.

26. Select the correct statement(s).

A. Activated integrin proteins on the surfaces of monocytes are responsible for tightly binding the cell on the endothelial cell surface inside a blood vessel.
B. Shortly after surgery to remove breast cancer that has metastasized to the axillary lymph nodes, the upper extremity of a female patient will often temporarily enlarge due to edema.
C. Oxytalan fibers are an extracellular fiber found in the skin as part of the elastic fiber system.
D. A person suffering from leukocyte adhesion deficiency would not be able to efficently extravasate leukocytes from his blood vessels.
E. All of the above are correct.

SELECT THE SINGLE BEST ANSWER:

27. Select the **INCORRECT** statement.

A. The extracellular matrix of hyaline cartilage contains abundant collagen type II. ✓
B. Cartilage and bone matrix contain the same amount of proteoglycans.
C. Proteoglycan aggregates are responsible for giving hyaline cartilage its characteristic high water content and its ability to act as a shock absorber. ✓
D. The presence of water loosely bound to the proteoglycans in cartilage permits the rapid diffusion of nutrients and wastes. ✓
E. Cartilage increases in size by intersitital and appositional growth in the fetus. ✓

28. Select the **INCORRECT** statement.

A. Elastic cartilage is found in the epiglottis and pinna of the ear. ✓
B. The perichondrium of the hyaline cartilage rings in the trachea is composed of dense irregular connective tissue. ✓
C. The suture line in the skull is a form of a fibrous, synarthrodial joint. ✓
D. The elastic fibers found in elastic cartilage do not contain the elastic microfibril component.
E. Plasma cells are usually not found within hyaline cartilge matrix. ✓

29. Select the **INCORRECT** statement.

A. Fibrocartilage is found only in the intervertebral disc.
B. Articular cartilage receives most of its nutrients from synovial fluid. ✓
C. Tropoelastin can be secreted by chondrocytes. ✓
D. The outer portion of an intervertebral disc consists of dense regular connective tissue. ✓
E. The hyaline cartilage of a knee joint is reinforced with collagen type I fibers. ✓

30. Select the correct statement.

A. Hyaluronic acid is found only in cartilage matrix.
B. There are no glycoproteins present within the normal hyaline cartilage matrix.
C. The articulation between the ribs and the sternum can be considered a symphysis.
D. The articulation between the tooth and mandible can be considered a diarthrodial joint.
E. None of the above are correct.

TRUE AND FALSE: **TRUE = A, FALSE = B**

31. Colchicine and vinblastine are excellent chemotheraputic drugs because they bind to the intermediate filaments and prevent the subunits from binding together.

32. Heart muscle and neurons would be one of the least affected tissues of colchicine chemotherapy.

33. Red bone marrow could be considered either reticular tissue or hemopoietic tissue.

34. The cause of scurvy is the lack of vitamin C, which is used as a cofactor for procollagen peptidase activity which clips the extra tail off the procollagen molecule as it leaves the fibroblast/cyte.

35. Opsonin is an immunoglobulin found on marcrophages and is used in one form of receptor mediated phagocytosis.

36. Anaphylactic shock can be prevented by the action of the eosinophils.

37. Spots of blood (petechae) on the lower extremity in scurvy is due to poor collagen formation in the vessels.

38. The epiphyseal plate can be considered an amphiarthrodial joint.

39. The administration of glucosamine sulfate (an intermediate in proteoglycan synthesis) may promote the production of proteoglycans in a person suffering from osteoarthritis.

40. Rheumatoid arthritis is an autoimmune disease which attacks the synovial membrane of joints.

41. The central canal carries the blood vessel which supplies all the osteocytes of a single osteon.

42. Nutrients reach the outermost osteocytes in the osteon by flowing through small blood vessels in the canaliculi.

SELECT THE SINGLE BEST ANSWER:

43. Select the **INCORRECT** statement.

A. Endochondral ossification only occurs within a hyaline cartilage model.
B. A forming osteon is an example of "metabolic bone".
C. The bone first laid down during endochondral and intramembranous ossification is woven.
D. Interstitial lamellae and mature osteons are examples of "structural bone".
E. Only endochondral ossification and intramembranous ossification must occur to achieve proper modeling of a long bone like the femur.

44. Select the **INCORRECT** statement.

A. Trabecular packets are formed by remodeling of spongy bone.
B. The function of epiphyseal plates is to lengthen the long bones of the body.
C. Inner circumferential lamellae are formed by the endosteum.
D. Approximately 95% of the skeletal mass of an individual turns over during the course of a year.
E. It takes less time for spongy bone to remodel than compact bone.

45. Select the **INCORRECT** statement.

A. Cartilage will form in the callus of a large complete fracture due to lower oxygen content in the proliferating tissues farther away from the blood supply.
B. An adult suffering from an over-secretion of growth hormone (somatotropin) has acromegaly resulting in thickened facial bones and enlarged hands and feet.
C. Intramembranous ossification occurs on the bone fragments immediately adjacent to the break in a fractured bone.
D. Union in a compound complete fracture occurs when the calluses formed by the distal and proximal fragments meet and join in the middle of the gap.
E. Osteoprogenitor cells only arise from the periosteum during fracture repair.

SELECT THE SINGLE BEST ANSWER:

46. The source of energy for the initial contraction of skeletal muscle is derived from...

A. the glycolytic activity of myosin.
B. the adenosinetriphosphatase activity of myosin. ATP
C. release of energy due to cyclical conformational changes in actin.
D. adenosinetriphosphatase activity of tropomyosin.
E. A and B, only.

47. A cytological feature common to cardiac muscle cells, myofibroblasts, and cleavage furrows is...

A. sacroplasmic reticulum.
B. thick filaments. (myosin)
C. triads.
D. actin filaments. (thin)
E. basement membrane.

48. In a skeletal muscle cell, the sarcoplasmic reticulum...

A. occurs in the form of diads.
B. conducts the action potential to the interior of the cell.
C. is most obvious during cell division.
D. is directly continuous with the sarcolemma.
E. is able to release and resequester calcium.

49. In cardiac muscle, the release of calcium from the sarcoplasmic reticulum is triggered by which of the following?

A. Inositol 1,4,5-triphosphate
B. Calcium influx during the muscle action potential
C. Acetylcholine
D. ATP
E. Creatine

MATCHING: **Questions # 50-59**

Match the structure (A-E) with the most appropriate desciption (#'s 50-54).

A. Interstitial lamellae
B. Cement line
C. Osteoid
D. Gaps between tropcollagen molecules in type I collagen
E. osteoclast

correct answers

50. D thought to initate mineralization of bone matrix.
51. C unmineralized bone matrix laid down by osteoblasts.
52. E monocyte is immediate precursor.
53. A heavily mineralized.
54. B outer limit of osteon.

Match the substance (A-E) with the disease or process most closely associated (#'s 55-59).

A. Parathyroid hormone — ↑ osteoclast activity
B. Calcitonin → ↓ OC activity
C. Lack of vitamin D — rickets.
D. Greater than normal amount of vitamin E
E. None of the above

correct answers ↓

C 55. D Primary mineralization prolonged D
D 56. C Early closure of the epiphyseal plate C
B 57. B This substance targets cells containing alkaline phosphatase and make them more active. B = breakdown cartilage + ↑ calcification
A 58. E Target cells of this substance contain carbonic anhydrase E
C 59. A Causes osteomalacia D

SINGLE BEST ANSWER:

60. Each of the following matched pairs is correct **EXCEPT**.

A. Peyer's patch nodules - transient
B. Red pulp - thymus
C. Macrophages - lymph nodes
D. Hassall's corpuscles - thymus
E. Sheathed arterioles - spleen

61. Select the correct statement. Palatine tonsils...

A. are situated at the root of the tongue.
B. are covered with ciliated pseudostratified columnar epithelium.
C. filter lymph.
D. have epithelially lined crypts and lymphoid follicles.
E. are encapsulated lymphatic organs.

62. Abundant concentrations of B-lymphocytes would be found in all of the following locations **EXCEPT**:

A. Stimulated Peyer's patches
B. Germinal centers
C. Peripheral splenic white pulp outside of PALS
D. Paracortex of lymph node
E. Stimulated lymphatic follicles

63. All of the following statements are true of the thymic cortex **EXCEPT**:

A. It is the site of T-lymphocyte differentiation.
B. It contains Hassall's corpuscles. → medulla
C. The only circulatory vessels present are blood capillaries.
D. Epithelial reticular cells are present.
E. It is the site of the blood-thymus barrier.

64. Penicillar arteries are characteristic of...

A. splenic white pulp.
B. thymus.
C. splenic red pulp.
D. lymph node paracortex.
E. Peyer's patches.

SINGLE BEST ANSWER:

65. Select the correct statement. Epithelial-reticular cells of the thymus...

A. differentiate into white fat cells.
B. line blood-filtering sinusoids.
C. attach to one another via desmosomes.
D. line the medullary cords.
E. are derived from monocytes.

66. Select the correct statement. A germinal center...

A. lacks mitotic figures.
B. is lined by connective tissue septa.
C. contains lymphoblasts and plasmablasts.
D. is where T-lymphocytes mature.
E. has high endothelial venules.

67. Plasma cells originate from the differentiation of ...

A. monocytes.
B. antigen-stimulated B-lymphocytes.
C. antigen-stimulated T-lymphocytes.
D. antigen-presenting cells.
E. macrophages.

68. The normal functions of the adult spleen include all **EXCEPT**...

A. maturation of red blood cells.
B. destruction of old red blood cells.
C. filtration of the blood.
D. antigen presentation.
E. differentiation of B-lymphocytes.

69. Which one of the following pairs would be the most characteristic of the paracortex in the lymph node?

A. T-lymphocytes and high endothelial venules
B. B-lymphocytes and high endothelial venules
C. T-lymphocytes and cords of Billroth
D. Macrophages and plasma cells
E. Germinal centers and high endothelial venules

SINGLE BEST ANSWER:

70. Which is **NOT** an antigen-presenting cell?

A. Monocyte
B. Macrophage
C. B-lymphocyte
D. Epithelial dendritic cell
E. M-cell

71. Select the correct statement. Eosinophils...

A. are related to mast cells.
B. contain major basic protein in their primary granules.
C. are more numerous than neutrophils.
D. are readily identified by their multilobed nucleus.
E. have a role in immune reactions against parasites.

72. Which one of the following characteristics is valid for the polychromatophilic erythroblast?

A. Polyploid
B. Eosinophilic cytoplasm with perinuclear halo
C. Synthesis of histamine
D. Cytoplasmic polychromasia
E. No nucleus

73. In embryos, hematopoiesis first begins in the ...

A. yolk sac.
B. liver.
C. spleen.
D. bone marrow.
E. all of the above.

74. The mononuclear-phagocyte system does **NOT** include...

A. mast cell.
B. Kupffer cells.
C. osteoclasts.
D. macrophages.
E. microglia.

SINGLE BEST ANSWER:

75. Which is **NOT** true of basophils?

A. They are less than 1% of leukocytes in circulating blood.
B. They have larger granules that are fewer in number than eosinophils.
C. They are equivalent to mast cells.
D. They release histamine.
E. They have IgE receptors on their surface.

76. The following sequential developmental pairs are correct **EXCEPT**:

A. megakaryocytes - platelets
B. orthochromatophilic erythroblast - reticulocyte
C. activated B-lymphocyte - plasmablast
D. BFU-erythroid - erythropoietin
E. stab cell - neutrophil

77. Select the **INCORRECT** statement. Hematopoietic cords...

A. are lined by adventitial cells.
B. are underlined by a continuous basement membrane.
C. are lined by endothelial cells that are active in endocytosis.
D. contain hematopoietic islands.
E. contain white fat cells.

78. Select the **INCORRECT** statement. Megakaryocytes are...

A. multiploid.
B. have platelet demarcation channels.
C. give rise to platelets.
D. give rise to promyelocytes.
E. reside in red bone marrow.

79. Select the correct statement. Erythropoietin...

A. is an enzyme produced in the heart that influences erythropoiesis.
B. is an enzyme produced in the liver that influences erythropoiesis.
C. is an enzyme produced in the kidney that influences granulopoiesis.
D. is an enzyme produced in the kidney that influences hemaglobin affinity for oxygen.
E. None of the above.

SINGLE BEST ANSWER:

80. Which statement is correct for Peyer's patches?

A. M cells act as antigen-presenting cells.
B. Activated T-lymphocytes do not enter the circulation.
C. IgG is the main immunoglobulin secreted.
D. There is a connective tissue capsule.
E. None of the above is correct.

81. Which of the following blood cells exhibit phagocytosis for antigen-antibody complexes?

A. Lymphocyte
B. Neutrophil
C. Eosinophil
D. Basophil
E. Monocyte

82. Which is **NOT** true of B-lymphocytes?

A. They are usually fewer than T-lymphocytes in circulating blood.
B. They characteristically occupy the central regions of germinal centers.
C. They form plasma cells.
D. They are the chief constituent of the periarteriolar lymphatic sheath.
E. They divide in the bone marrow and in most peripheral lymphatic organs.

TRUE OR FALSE: **A = TRUE, B = FALSE**

83. The nucleolus is the site or messanger RNA synthesis.

84. Glycogen and lipid droplets are non-membrane encircled cell inclusions.

85. The phosphorylated carbohydrate responsible for directing proteins to the lysosomal compartment is glucose 6-phosphate.

86. The functions of the smooth endoplasmic reticulum include, but are not limited to, steroid hydroxylation and drug detoxification.

TRUE OR FALSE: **A = TRUE, B = FALSE**

87. In a pure white muscle, such as the tail of a lobster, ATP production will occur principally via mitochondrial oxidative phosphorylation.

88. The mode of secretion of a sebaceous gland is apocrine.

89. Gap junctions are involved in the transfer of electrical impulses in smooth muscle and cardiac muscle cells.

90. Epithelial tissue is embryologically derived from ectoderm, mesoderm, and endoderm.

91. The close association of the Zonula Occludens, the Zonula Adherens, and Desmosomes near the apical surface of epithelial cells is called the junctional complex.

SINGLE BEST ANSWER:

92. The action potential component of the nervous impulse is generated in...

A. dendritic spines.
B. the axon hillock.
C. the axonal bouton.
D. Nissl bodies.
E. the synapse.

93. Which of the following statements concerning neuroglia is true?

A. Neuroglia are more numerous than neurons.
B. Neuroglia do not proliferate in the adult nervous tissue.
C. Neuroglia are large cells compared to neurons.
D. Astroglia are the myelin- forming cells of the CNS.
E. Microglia are derived from neurons and therefore possess axonal processes.

SINGLE BEST ANSWER:

94. Nerve cell bodies can be seen microscopically...

A. near the sense organs of skin.
B. in any cross section of a peripheral nerve.
C. only in the CNS (Central Nervous System).
D. in the CNS, autonomic ganglia, and spinal ganglia.
E. All of the above.

95. Unmyelinated axons of PNS (Peripheral Nervous System) are...

A. naked neuronal processes devoid of any structural association with the glial cells.
B. axons of large diameters.
C. conduction fibers for tactile discrimination.
D. enclosed within the simple clefts of Schwann cells.
E. None of the above.

96. The connective tissue covering of the CNS include all of the following **EXCEPT**:

A. Dura Mater -- Dense connective tissue that is continuous with the periosteum of the skull.
B. Epineurium -- Loose areolar connective tissue which lines each of the blood vessels.
C. Arachnoid -- Connective tissue containing collagen and elastic fibers covered by an epithelium.
D. Pia Mater -- Loose connective tissue which adheres closely to the contours of the brain.
E. Meninges constitute the connective tissue covering of the brain.

97. Surface specializations of neuronal dendrites designed to increase the area of synaptic contacts are known as...

A. dendritic boutons.
B. dendritic spines.
C. dendritic nodes.
D. dendritic spuds.
E. None of the above.

SINGLE BEST ANSWER:

98. Which of the following is **NOT** a component of the blood/brain barrier?

A. Capillary endothelial cells with "tight" junctions
B. Pericytes
C. Basement membranes of the capillary endothelial cells
D. Foot-like processes of astroglia which abut against the basement membrane of the capillary endothelial cells.
E. Myelin sheath

99. Which of the following is **NOT TRUE** of myelin?

A. It is produced by Schwann cells.
B. It serves as an electrical insulator responsible for the saltatory conduction of action potentials.
C. It is produced by oligodendrocytes.
D. It can replace neurons following neuronal damage.
E. It functions to accelerate nerve conduction velocity.

100. Which of the following statements is **NOT TRUE** of the synaptic vesicles in the chemical synapse?

A. Synaptic vesicles are membrane bound vesicles.
B. Synaptic vesicles are released by the pre-synaptic terminals at the active zones.
C. Synaptic vesicles are often associated with the presence of mitochondria and synaptic bars (membrane densities).
D. Synaptic vesicles are transported from cell body to the synaptic terminals by the mechanism of neuronal impulses (action potentials).
E. Membrane proteins of synaptic vesicles are recycled.

Id #: [redacted] Class: FIRST YEAR Course #: ENTER94
Name: Time:
Date: 2-8-1995

Test Key:	BDAAEBBDEC	DEEACDCCBD	EABBABAABA	AACCBAAEAA	ABAAABABAA
Items 1-50:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	*B*B******	**********	*******B*B	**********	**BB******
Test Key:	BDCAABDBAA	ABBABADCCA	BEBBCDEECC	CABDEEECAB	DEBACADDBC
Items 51-100:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	********B*	*******BE*	****DE****	**D*C*D***	E*D***C***

BONUSED QUESTIONS = 36, 97